Leaching Index (for Nitrogen and other soluble nutrients)

This section provides a way to determine the degree to which water percolates below the root zone in certain soils. Percolating water containing dissolved nitrates or other soluble nutrients can be a hazard to ground water. The Method is based on a Leaching Index (LI)[1/]. The LI uses annual precipitation, hydrologic soil group, and rainfall distribution data.

A leaching index has been developed for each hydrologic soil group. Soils in dual hydrologic groups (C/D) should use the hydrologic group that gives the highest leaching index.

The LI does not account for irrigation. If irrigation is applied only to supply plant needs, there will be little additional loss below root zone. The additional loss would be relative to the precipitation events after the soil profile is saturated or nearly saturated due to irrigation.

Procedure

Follow these steps to determine the Leaching Index of a certain soil:

1. Determine the soil hydrologic group for the field(s).
2. Determine Leaching Index from table below.
3. For fields with Leaching Index Rating:
   - **Moderate** – consider implementing BMPs that apply.
   - **High** – implement BMPs as applicable.

Hydrologic Group	County	Leaching Index	Rating
A	All Counties	>10 inches	High
B	No. Aroostook (Ft. Kent and PI)	2 to 10 inches	Moderate
B	All Other Counties	>10 inches	High
C	Washington, Hancock, Knox, Lincoln	>10 inches	High
C	All Other Counties	2 to 10 inches	Moderate
D	All Counties	2 to 10 inches	Moderate
Soils with less than 20 inches to bedrock	All Counties		High
Glacial outwash and well-drained alluvial soils	All Counties		High

Leaching Index (LI) Ratings:

1. An LI less than 2 inches (Low) indicates that the potential for leaching below the root zone is low.
2. An LI between 2 and 10 inches (Moderate) may contribute to soluble nutrient leaching below the root zone.
3. An LI greater than 10 inches (High) will contribute to soluble nutrient leaching below the root zone.

Nitrate Leaching BMPs:

- Do not apply N in excess of soils test recommendations.
- Utilize tissue testing, chlorophyll meters, and spectral analysis technologies to determine the need for N.
- Use slow- or controlled-release fertilizers.
- Use nitrification inhibitors when making broadcast applications of commercial nitrogen.
- Use plants to hold N over winter:
    a. Plant winter-hardy cover crops, especially to fields that receive manure in fall.
    b. Do not incorporate sods in the fall.
    c. For fall-killing of sods (chemical): wait until the soil temperature at 4 inches is 45 degrees or less.
- Manure:
    a. Do not fall-apply manure to bare ground. Make fall manure applications only to a growing sod or winter-hardy cover crop. Do not exceed 50 lbs N/ac.
    b. When legumes comprise more than 50% of a stand, limit manure application to less than 150 lbs of available N.
    c. Minimize or avoid use of manure on sod fields that will be rotated to annual crops in spring.
- Starter N:
    a. If N must be broadcast rather than side dressed, apply within three days of planting.
    b. For row and cereal crops, including corn, starter fertilizer N rates should be below 40 lbs/ac under normal conditions.
- Corn N sidedress:
    a. Make applications when corn has at least 4 true leaves.
    b. Use the Pre-sidedress Nitrogen Test (PSNT) to determine sidedress rate.
- Other University-recommended technologies that improve N use efficiency. (Adapt-N)

1/ The method to calculate the Leaching Index was developed by J.R. Williams and D.E. Kissel in "Water Percolation: An indicator of N Leaching Potential "from Managing Nitrogen for Groundwater Quality and Farm Profitability, Edited by R.F. Follet, 1991.